

gation models have been developed for a number of turfgrass species.

Three companies market infrared thermometry instruments: Everest Instruments, AgriTemp and Standard Oil. Carrow says only Standard Oil has combined the thermometry with a computer.

According to Standard Oil's Bronson Gardner, the six-pound unit combines a thermometer gun with a 64K computer worn by a strap over the shoulder.

"Based on field research, we've developed a model which measures what the canopy temperature is and should be," Gardner says. "There doesn't seem to be a difference from

warm- to cool-season grasses in evaporation rate and canopy temperature."

In some respects, says Gardner, the instrument works like a portable weather station. Called the ST-27 because it can store information for up to 27 holes on a golf course, it monitors air temperature, humidity, sunlight intensity and canopy temperature for fairway, green, tee, rough and another spot of choice on each hole.

Steve DeSutter, sensor technologies manager for Standard Oil's Engineering Materials Company, says that, since the ST-27 is portable, it is more area specific than a weather station, giving more accurate readings

for more areas on the course.

The computer makes readings four times a second and can recall a three-day history for each spot and print the history in graph form when downloaded onto a printer. From this data, a landscape manager could work out an irrigation schedule. The ST-27 was expected to be in distribution at the end of June.

"The sky's the limit" for technological advancements, notes Neil J. Bustamante, a superintendent at a Hawaiian resort golf course. But, he cautions, "it should be remembered that those assigned the responsibilities of operation of these systems have their 'limitations.'" **LM**

A dry idea, sort of

It is water conservation brought to an art form. And it draws from every aspect of water conservation.

The only thing new about the concept is its name: "xeriscaping," a term that originated in the Denver area less than 10 years ago.

The name is appropriate, though slightly inaccurate. It is derived from the Greek "xeros," meaning dry. However, xeriscaping is not a totally dry method of landscaping. All living plants require a certain amount of water.

Rather, xeriscaping is a combination of landscape design techniques: reducing areas of ever-thirsty turf, using water-conserving plants well-adapted to native soils grouped together in "hydrozones" (areas containing plants with like irrigation needs), and efficient irrigation systems used only when necessary.

Xeriscaping is based on seven fundamental principles:

- Start with a good design.
- Improve the soil.
- Use mulch.
- Limit lawn areas.
- Choose low water-use plants.
- Irrigate efficiently.
- Practice good maintenance.

Mulch is recommended to reduce soil moisture evaporation, decrease weed growth and control soil temperatures, eliminating extremes.

Adjusting maintenance practices is also a benefit. Applying less fertilizer, weeding quickly to reduce competition for water, raising mowing heights and mowing more frequently, and aerating for improved water penetration are all beneficial.

Research has been conducted to find the most drought-resistant and



A non-watered, non-mowed roadway corridor in Orange County, Calif. is safer, more attractive and more water-efficient.

water-efficient turfgrasses for use in xeriscaping.

Dorothy Borland of The Turf Expert in Denver recommends buffalograss or buffalograss mixed with blue grama for low water use and drought tolerance. But, she notes, the warm-season grasses go dormant from October to May. "Most people who choose buffalograss know something about it," she says.

An added benefit, she notes, is that the native buffalograss only grows to about six or eight inches, and is therefore low-maintenance. But, she

stresses, "I am still careful before recommending this grass. It has poor shade tolerance and when thinned by too much water or shade, bluegrass and other weedy plants will invade." She notes that the grass also has a long dormancy period.

In addition, Borland recommends using wheat grasses and smooth brome grasses. Borland says she also has been satisfied with the drought tolerance of improved tall fescues.

The major objective is to reduce bluegrass areas, Borland says, but also

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to choose alternatives other than buffalo grass. She says that one-third of her clients choose xeriscaping.

Native plants are always recommended for new xeriscapes and conversions to xeriscapes. They are naturally adapted to the soil and environmental conditions and require less maintenance and irrigation. But as with all new plants, natives need to be watered sufficiently until proper root development has occurred.

As for irrigating lawns, Borland says, "so much of it is what they (customers) expect. How little water can we use and still get by with a good-looking lawn?" The key is to find a balance between giving the customer the lawn desired while also giving them the maintenance desired, she adds.

The management principles naturally apply to arid areas where natural rainfall cannot keep up with public consumption, though xeriscaping can be used anywhere. "Inquiries are coming in on a global basis," says Ken Ball of the Denver Water Department. Ball is also secretary of the National Xeriscaping Council.

And xeriscaping is effective, often cutting down on water use outside the home by 40 percent or more.

Becky Garber of Colorado Landscape Enterprises, Arvada, Colo., says her company worked with a group of Aurora homeowners to implement xeriscaping and general water conservation practices on a 6½-acre property called Sunstone. She says the program reduced water bills by \$15,000 in one year.

A study was conducted among 548 townhouses in Marin and Sonoma counties in California. Xeriscaped townhouses averaged about an \$85 savings compared to conventional landscaping over the eight-and-a-half month test period. More importantly, water use was cut by 30,000 gallons per townhouse, a 54 percent reduction.

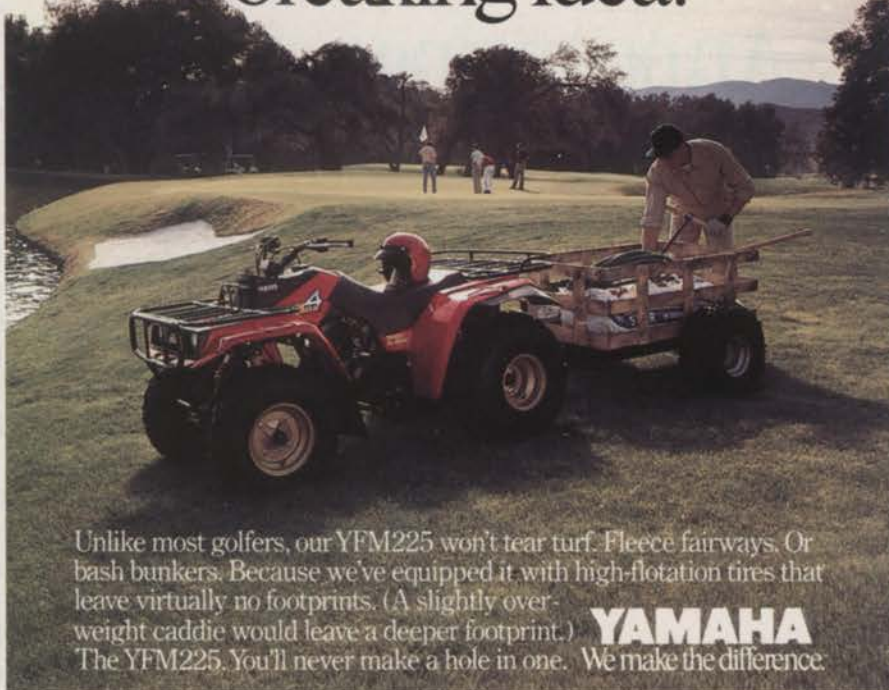
Xeriscaping councils exist in seven states (see list for contacts), with an eighth, New Mexico, expected this summer.

To help promote xeriscaping, many community xeriscaping councils have established exhibition gardens to give people a visual idea of what to expect.

"They show plants and how xeriscaping can be pulled off," explains Ball. "If there's something a person can go and wiggle their toes in and sit down with, it's more effective."

—Jeff Sobul

Not a ground breaking idea.



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SLIDING AWAY

A valuable resource not given enough thought is soil. Topsoil is frequently lost from runoff due to heavy rainfall or improper irrigation.

While irrigation rates can be adjusted to correct a problem, rainfall can't. The impact of falling water on surface soil can destroy the structure of surface soil, cause surface to settle and seal, decreasing infiltration and increasing runoff, says Penn State's Tom Watschke, Ph.D. Therefore, it becomes necessary to protect the soil from eroding away.

The four basic types of erosion are:

- splash erosion when raindrops strike the soil surface and break soil aggregates into fine particles which can be carried away;
- sheet erosion when water moves across the soil surface and removes thin sheets of soil;
- rill erosion when water moves across the soil surface and cuts small ditches a few inches across; and
- gully erosion when water flows across one spot long enough to cut large gullies.

The best method of erosion control is establishing a good stand of turf. Under good conditions, and without

stringent time requirements, reseed- ing can do the job.

But if the problem is severe, and immediate, Watschke notes it is better to use sod. The sod is more dense, and with bluegrass sod, "it's an instant fix. The day you lay it, the effect on runoff and erosion is immediate," he says.

The slow-establishing seed is less dense and subject to runoff. The problem with sod is a purely economic one. It costs more. Notes Watschke, it comes down to a cost vs. benefit decision.

But other methods are often more economical. They involve using geotextiles, either natural or synthetic.

On reseeded soil, says Watschke, putting a mulch/straw mix on top reduces the impact of rainfall. "The structure of the soil remains, the runoff decreases. Once the plants establish, they will take care of the runoff."

Other natural geotextiles come in blanket form, such as North American Green's straw and/or coconut fiber blankets. According to the company, the blankets are designed to reduce moisture loss while allowing

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